opening, the glass tube *g* is fused off, and the upper part B of the apparatus removed from the lower part A, and transferred afterwards to a drying oven.—S. R.

A New Separation of Nickel and Cobalt. M. Ilinski and G. von Knorre. Ber. **18**, 699.

If an alcoholic or acetic acid solution of nitroso-β-naphthol be treated with a neutral or hydrochloric solution of cobalt, a bulky purple precipitate is obtained, which resists all action of alkalis, acids, oxidation or reduction. The precipitate is cobalti-nitroso-β-naphthol

$$[C_{10}H_6O(NO)]_2Co.$$

If a solution of nitroso-β-naphthol, in 50% acetic acid, or an aqueous solution of nitroso-β-naphthol sodium, be treated with a solution of a nickel salt, a brownish-yellow precipitate is produced, which is slightly soluble in water and alcohol. Hydrochloric and sulphuric acids deprive it very easily of its metal, leaving behind nitroso-β-naphthol, which remains in solution if sufficient acetic acid is present. If, therefore, an acetic acid solution of nitroso-β-naphthol be treated with little hydrochloric acid, and then with the solution of a nickel salt, no precipitate is produced. On these reactions the following method of separating cobalt from nickel compounds is based:—The solution containing these metals, as sulphates or chlorides, is treated with a few cc. of hydrochloric acid. The liquid is warmed, and a hot solution of nitroso-β-naphthol in 50% acetic acid is added in excess. The precipitate is allowed to settle, and after cooling the supernatant liquid is examined whether it gives a turbidity with a new addition of nitroso-β-naphthol solution. If the precipitation is complete, the precipitate is filtered, after some hours' standing, and washed at first with cold, then with warm 12% hydrochloric acid, until all nickel is removed, and at last with hot water. The filter is allowed to dry, and a few grammes of pure crystallised oxalic acid are added to it. It is then slowly burned in a tared Rose crucible, and the residue ignited in an atmosphere of hydrogen, when pure metallic cobalt is obtained. In the filtrate from the cobalt precipitate, after evaporating the bulk of acetic acid, the nickel can be quantitatively separated by the addition of potassium hydrate. But it is preferable to precipitate in a measured portion of the solution both cobalt and nickel, and, after reducing them in a hydrogen current, to weigh the metals. In another portion, the weight of cobalt is determined by the process as mentioned above, and the amount of nickel can then be estimated by difference. The authors give the results of several analyses, which prove the method very trustworthy indeed. It is also shown that the reaction is far more sensitive than Portman's process with potassium nitrite and acetic acid. Small quantities of cobalt can be determined very accurately when mixed with large quantities of nickel.

—S. H.

A New Method of Estimating Nitrogen, of General Application. Carl Arnold. Ber. **19**, 806.

The author proposes the following method of estimating nitrogen in inorganic and organic substances, with which he has obtained very accurate results with nitrates, nitro-compounds, azo-compounds, amido-compounds, etc. The method is based on the methods which have been already proposed by Tamm-Guyard (combustion with a mixture of soda-lime and sodium-hyposulphite), and by Ruffle (combustion with a mixture of soda-lime, sodium-hyposulphite, carbon and sulphur), but which do not give good results with all substances. It consists in heating the substance with a mixture composed of equal parts of soda-lime, sodium-hyposulphite, and sodium-formiate, the operation being performed like an ordinary soda-lime estimation. The combustion tube is charged with 12 to 15cm. of the mixture and substance, 15 to 20cm. of the mixture alone, and 5 to 10cm. of soda-lime, and heated to a moderate red heat. The operation should last about an hour, and at the termination air is drawn through for five minutes to clear out the last traces of the ammonia. In order to obtain good results, it is essential that the mixture should be packed tightly into the tube (by tapping it in an upright position) and not leave a channel along the top. The proportions of the reducing mixture can be varied considerably, and the sodium hyposulphite can be replaced by 10% of sulphur.

—A. G. G.

On a Colour Reaction of some Diketones. Eug. Bamberger. Ber. **18**, 865.

A few drops of aqueous caustic potash are added to a hot alcoholic solution of the diketone (air being excluded as far as possible); if a dull red colouration is produced, which vanishes on shaking with air, it may be concluded that the diketone used has its two CO groups adjacent. The absence of a colouration, however, is not a positive proof that the CO groups are not adjacent.—A. G. G.

New Books.

On Certain Indications of the Existence of an Allotropic Modification of Elementary Nitrogen, and on the Synthesis of Ammonia. By George Stillingfleet Johnson. London: J. & A. Churchill, 11, New Burlington Street, 1885.

This is an 8vo volume, bound in cloth, containing 32 pages of subject matter. The work is divided into four chapters, and is illustrated by three woodcuts. The chapters are headed as follows:—Chapter I. Historical Electro-chemical Researches. (i.) Direct Synthesis of Ammonia by means of the Silent Discharge. (ii.) Observations of MM. Dehérain and Maquenne, and of MM. P. and A. Thénard, on the Action of the Silent Discharge upon Water Vapour, and upon a Mixture of Nitrogen Gas and Water Vapour. (iii.) Action of the Electric Spark. Chapter II. Researches on the Synthesis of Ammonia from the Gas evolved by the action of Heat upon Solutions of Ammonium Nitrite. Chapter III. Further Experiments on the Nature of the Gas produced by action of Heat upon Solution of Ammonium Nitrite, conducted in 1883. Chapter IV. Experiments with Atmospheric Nitrogen.

The book contains mainly the subject matter of two papers published in the *Journal of the Chemical Society* of 1881, as well as that of three as yet unpublished papers.

Lessons in Elementary Practical Physics. By Balfour Stewart, M.A., LL.D., F.R.S., Professor of Physics, Victoria University, The Owens College, Manchester, and Mr. W. Haldane Gee, Demonstrator and Assistant Lecturer in Physics, The Owens College. Vol. I. General Physical Processes. London: Macmillan & Co., 1885. [All rights reserved.]

This small 8vo volume, bound in red cloth, and comprising besides Preface, Table of Contents, and a List of Tables, 291 pages of subject matter, is the first of three volumes, of which the remaining two, yet to follow, will treat respectively of "Electricity and Magnetism" and "Heat, Light, and Sound."

The work is illustrated by 103 well-executed woodcuts, and the concluding 33 pages of subject matter are usefully devoted to an Appendix, in which the following items receive attention: A. On the Selection, Conduct, and Discussion of operations suitable for the Physical Laboratory. B. Centimetre, Gramme, Second (C.G.S.) System of Units. C. Practical Notes.

As regards the matter in the body of the work, the arrangement, and to some extent the treatment of this, may be conceived from the chapter headings, which follow:—Chapter I. Measurement of Length. Chapter II. Angular Measurements. Chapter III. Estimation of Mass. Chapter IV. Measurement of Area and Volume. Chapter V. Determination of Density. Chapter VI. Elasticity, Tenacity, and Capillarity. Chapter VII. Determination of Atmospheric Pressure. Chapter VIII. Time, Gravitation, Moments of Inertia. Appendix.

Monthly Patent List.

ENGLISH APPLICATIONS.

1885.

I.—GENERAL PLANT, APPARATUS, AND MACHINERY.

5119 H. E. Newton, London—Communicated by A. L. G. Dehne, Germany. Improvements in the method of and apparatus for purifying the feed-water for steam boilers. April 25

5310 J. Laidlaw, Glasgow. Improvements in centrifugal machines, otherwise known as hydro-extractors. Complete specification. April 30

5816 F. J. Austin and S. Low, jun., London. The prevention of the formation of boiler crust. May 12

5903 O. Imray, London—Communicated by H. B. Scott, France. An improvement in filter presses. Complete specification. May 13

6053 E. Burton, London. Improvements in furnaces for the combustion or destruction of refuse. Complete specification. May 16

6065 W. P. Thompson, Liverpool—Communicated by A. Buttner and C. Meyer, Germany. Improvements in concentrating aqueous solutions and the like, and in drying the resultant products, and apparatus therefor. Complete specification. May 18

6066 W. Weldon, Burstow, Surrey—Communicated by A. R. Pechiney et Cie, France. Improvements in apparatus for cooling gases and vapours.

II.—FUEL, GAS, AND LIGHT.

5113 F. Leslie and J. A. Wanklyn, London. Improvements in the treatment of gas and in the materials and apparatus employed therein. Complete specification. May 2

5638 F. Lennard, Westminster. Improvements in apparatus *for converting oils into gaseous fuel, and in its application to* the heating of boilers, stills, and other similar plant. May 7

5615 C. Marquis de Montgrand, London. A new or improved process and apparatus for the production at will of heat and cold, dry or moist, by the compression and rarefaction of the *air or of gases. Complete specification. May 7*

5955 F. Snelling, London. Improvements in artificial fuel. May 11

5980 A. Wilson, London. Improvements in gas producers. May 15

6059 J. McNair, Glasgow. Improvements in furnaces of retort chambers used in gas manufacture, and in means for supplying heated air thereto. May 16

III.—DESTRUCTIVE DISTILLATION, TAR PRODUCTS, Etc.

5002 H. Simon and W. Charlton, London. Improvements in hydraulic mains and valves for conducting gases and other *products of distillation from coke-ovens, gas-retorts, gas-*producers, or other apparatus for the distillation of carbonaceous substances. April 22

V.—TEXTILES, COTTON, WOOL, SILK, Etc.

1953 E. de Pass, London—Communicated by F. Kugelmann, France. A process of heating and utilising the fruit of the Mauritia vinifera or Mauritia flexuosa to render it fit for *industrial purposes.* April 21

5512 B. Hallett and T. F. Wiley, London. A new or improved method of applying water-proofing material to pile and other goods. May 5

VI.—DYEING, CALICO PRINTING, PAPER STAINING, AND BLEACHING.

1979 J. Hebblewaite and E. Holt, Manchester. Improvements *in means employed for the production of designs on textile and* other fabrics or surfaces. April 22

5110 J. K. Kaye, Halifax. An improved method of dyeing a fast yellow colour on cotton and other vegetable fibres.

5782 O. Imray, London—Communicated by The Farbwerke vormals Meister, Lucius, and Brüning, Germany. Process for printing textile fibres by means of laevulic acid. May 11

6018 T. J. Hutchinson, Bury. An improved method of preparing waste for bleaching purposes. May 16

6057 W. Stewart, Glasgow. Improvements in calico-printing machines. May 16

VII.—ACIDS, ALKALIS, AND SALTS.

1902 A. Neilson and J. Snodgrass, Glasgow. Improvements in obtaining ammonia in connection with the distillation of oil-yielding or carbonaceous minerals. April 21

1908 G. A. Jarvis, London. Improvements in the manufacture of nitrous and nitric acids. April 21

5061 A. A. Croll, London. Improvements in the manufacture of muriate of ammonia and alum. April 23

5180 W. A. Hills, London. Improvements in the treatment of phosphates of alumina. April 27

5216 W. P. Thompson, Liverpool—Communicated by L. Imperatori, Germany. A new or improved process for the production of phosphate of soda or of potash from basic process slags and other phosphatic materials. Complete specification. April 28

5260 J. Brock and W. A. Rowell, London. Improvements in the manufacture of certain chromates and acid chromates. April 28

5280 W. L. Wise, London—Communicated by R. Radot, France. Improvements in effecting the decarbonation of earthy carbonates, such as carbonate of barium, carbonate of strontium, and the like, and apparatus therefor. April 28

5290 H. Bott, John Billinge, and James Billinge, Liverpool. Improvements in caustic or other drum heads, and lids therefor, and in tools or appliances for adjusting the lids. April 29

5388 H. Bollmann, London. Improvements in the manufacture of hyposulphates and sulphates of alkalis. May 1

5391 G. H. Blenkinsop and J. G. Gordon, London. Improved process for calcining sulphides, arsenides, and analogous compounds. May 1

5136 W. S. Squire, London. Improvements in the manufacture of sulphuric acid. May 2

5511 B. H. Thwaite, Tranmere, Cheshire, and J. Pedder, Appleton-in-Widnes. The utilisation and method of using liquid hydrocarbons as carbonising and neutralising agents in the alkali processes. May 5

5553 W. R. Lake, London—Communicated by the Bonsilate Company, United States. Improvements relating to the treatment of alkaline silicates and other materials, and to the formation of various articles therefrom. Complete specification. May 5

5620 C. Wigg, Liverpool. Improvements in the utilisation of certain residuals obtained in the manufacture of copper and alkali. May 7

5783 O. Imray, London—Communicated by The Farbwerke vormals Meister, Lucius, and Brüning, Germany. Improvements in the production of laevulic acid. May 11

5882 A. Bouko and F. G. A. Roberts, London. Improvements in the manufacture of potassium sulphites. May 13

5919 J. F. Chance, Liverpool. Improvements in the production of nitrate of ammonia and bicarbonate of soda. May 11

5920 J. F. Chance, Liverpool. Improvements in the purification of the alkaline lees known as tank or vat liquors. May 11

5915 A. French, Glasgow. Improvements in obtaining ammonium chloride and cyanogen compounds. May 11

6066 W. Weldon, Burstow, Surrey—Communicated by A. R. Pechiney et Cie, France. Improvements in apparatus for cooling gases and vapours. May 18

VIII.—GLASS, POTTERY, AND EARTHENWARE.

5012 R. Clark, Longport, Staffordshire. Improvements in machinery for batting potters' clay. April 23

IX.—BUILDING MATERIALS, CLAYS, MORTARS, AND CEMENTS.

4931 W. C. Murdoch and E. F. Murdoch, London. Improvements in pavements. Complete specification. April 21

5001 W. R. Lake, London—Communicated by A. van Berkel, Germany. Improvements relating to the preservation of wood for paving or similar purposes. April 22

5187 A. W. Lake, London—Communicated by T. Hyatt, United States. Improvements in illuminating tiles, and constructions made therefrom, and in the mode or process of manufacturing, and in constructing with the same. April 27

5188 A. W. Lake, London—Communicated by T. Hyatt, United States. Improvements in illuminating combination tiles. April 27

5189 A. W. Lake, London—Communicated by T. Hyatt, United States. Improvements in concrete lights. April 27

5213 T. C. Fawcett and J. D. Fawcett, Halifax. Improvements in machinery for pressing bricks, blockettes, tiles, and other articles. April 28

5351 E. Robbins, London. The novel manufacture of a new decorative concrete of slag combined with similar and other materials. April 30

5112 F. Ransome, London. Improvements in the manufacture of cement. May 2